

REMARKS

Claims 1-58 are pending in the above-captioned patent application after this amendment. Claims 1, 2, 8, 12-24, 30, 34-45, 48 and 51-59 have been rejected. Claims 3-7, 9-11, 25-29, 31-33, 46, 47, 49 and 50 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Applicants respectfully disagree with the rejection of claims 1, 2, 8, 12-24, 30, 34-45, 48 and 51-59. However, the Applicants have amended claims 13 and 35, and cancelled claim 59 without prejudice for the purpose of expediting the patent application process in a manner consistent with the goals of the Patent Office (65 Fed. Reg. 54603), and/or to clarify what the Applicants regard as the present invention.

Support for the amendments to claims 13 and 35 can be found throughout the originally filed specification. In particular, support for the amendments to claims 13 and 35 can be found in originally filed claims 12 and 34.

No new matter is believed to have been added by this amendment.

Reconsideration of the pending application is respectfully requested in view of the above-recited amendments and the arguments set forth below.

Oath / Declaration

The Examiner found the oath or declaration to be defective because it does not identify the citizenship of each inventor. Accordingly, a new oath or declaration in compliance with 37 CFR 1.67(a) identifying the application by application number and filing date along with the citizenship of each inventor is enclosed herewith.

Information Disclosure Statement

The applicants filed an Information Disclosure Statement on January 2, 2002, including Form PTO 1449 (modified). However, the applicants note that this Information Disclosure Statement has not been formally acknowledged by the Patent Office, nor has the Form PTO 1449 (modified) been initialed by the Examiner and provided to the applicants. Therefore, a duplicate copy of the Information Disclosure Statement dated January 2, 2002 is provided herewith, including a copy of the original return receipt

postcard indicating receipt by the Patent Office on January 28, 2002. No fee is believed to be necessary because the Information Disclosure Statement was timely filed. Additionally, a Supplemental Information Disclosure Statement is also being filed concurrently herewith.

Claim Objections

Claim 13 has been objected to because “there is no antecedent basis for ‘the conductor housing.’ Claim 12 includes a conductor housing but claim 13 does not depend from claim 12.”

Claim 13 has been amended to show its proper dependence from claim 12, thereby providing antecedent basis for “the conductor housing”. Somewhat similarly, claim 35 has been amended to show its proper dependence from claim 34, thereby providing antecedent basis for “the conductor housing”.

Rejections Under 35 U.S.C. §102(e)

Claims 1, 2, 8, 14, 15, 18-24, 30, 36, 39-45, 48 and 54-59 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,072,251 issued to Markle (“Markle”). The Applicants respectfully traverse the rejection of claims 1, 2, 8, 14, 15, 18-24, 30, 36, 39-45, 48 and 54-58, and respectfully submit that claims 1, 2, 8, 14, 15, 18-24, 30, 36, 39-45, 48 and 54-58 are patentable over the cited reference.

The Examiner contends that Markle discloses “a conductor array 606 that generates both a drive magnetic field and a stray magnetic field, an auxiliary conductor array 608 as described in column 10 lines 10-26 that generates an auxiliary magnetic field and reduces the stray magnetic field as described in column 11 lines 15-19.

In particular, the Examiner provides that “(i)n regard to claims 8, 30, and 48, see Markle column 10 lines 10-18 where 6 coil wires each are recited for wire layers 606 and 608. Dividing one set of six in half would produce a pair of coil sets for the auxiliary conductor array.”

Additionally, the Examiner contends that “(i)n regard to claims 14 and 36, see Markle column 11 line 19. The words ‘nearly canceled’ are viewed as being in the range of at least approximately 100.”

Further, the Examiner contends that “(i)n regard to claim 15, see Markle figure 6.

X-Y stages are a combination of a linear motor movable in the X direction and a linear motor movable in the Y direction.”

Still further, the Examiner provides that “(i)n regard to claims 18-22, 39-43 and 54-58, see Markle column 1 lines 13-17.”

Yet further, the Examiner contends that “(i)n regard to claim 59, see Markle column 10 lines 14-21. If n equals 2, then the number of drive conductors will be four.”

The Applicants provide that Markle is directed to a plurality of Halbach magnet arrays (eight as shown in Figures 6 and 7) 604-1 through 604-8 that are attached to the bottom surface of a movable wafer support X-Y stage 600, and a lower wire layer 606 and an upper wire layer 608, which are attached to a ferromagnetic platen 610, and which are spatially situated to be in cooperative relationship with magnet arrays 604-1 through 604-8. Therefore, selectable lateral and levitation forces for translationally moving movable stage 600 parallel to the X, Y and/or Z axes may be produced. (Markle column 9, line 64 through column 10, line 29, and Figures 6 and 7). Markle further comprises small cylindrical electromagnetic pairs 700-1 and 700-2, 702-1 and 702-2, and 704-1 and 704-2 that interact with a steady-state current that is required for levitation from the control electronics for the stage 600 to provide pitch, roll and yaw correction. (Markle column 10, line 40 through column 11, line 14, and Figure 7).

Halbach magnet arrays possess a unique orientation where each pair of adjacent magnets are rotated 90° with respect to each other. Markle provides that “(o)ne of the advantages of the one dimensional array of Halbach magnet arrays ... is that the magnetic fields on the side toward platen 610 (FIG. 6) are nearly doubled and the magnetic fields on the side toward wafer 602 (FIG. 6) are nearly canceled.” (Markle column 1, lines 63-67, column 11, lines 15-19, and Figures 6 and 7).

However, Markle does not disclose a motor drive conductor array that generates a drive magnetic field and a stray magnetic field, and an auxiliary conductor array that generates an auxiliary magnetic field that reduces the stray magnetic field. Based on the description of Halbach magnet arrays provided in Markle, it is in the nature of the Halbach magnet arrays themselves, without any interaction with the coils, that magnetic fields from the magnets are nearly doubled toward one side and are nearly canceled toward the opposite side.

In contrast to the cited reference, claim 1 of the present application requires “(a) conductor component ... comprising: a motor drive conductor array that generates a drive magnetic field and a stray magnetic field when electrical current is directed through the motor drive conductor array, the drive magnetic field interacting with the magnetic field of the magnet to generate a reactive force; and an auxiliary conductor array that generates an auxiliary magnetic field that interacts with the stray magnetic field and reduces the stray magnetic field.”

These features are not taught or disclosed by Markle. Accordingly, claim 1 is believed to be patentable under 35 U.S.C. §102(e). Additionally, the Applicants respectfully submit that any potential 35 U.S.C. §103 rejection of claim 1 is not appropriate because Markle does not teach or suggest the features of claim 1.

Because claims 2, 8, 14, 15 and 18-22 depend directly or indirectly from claim 1, they are likewise patentably distinguishable over Markle.

Additionally, in contrast to the cited reference, claim 23 of the present application requires “(a) brushless electric motor comprising: a magnet component including a plurality of magnets, each of the magnets being surrounded by a magnetic field; a conductor component that includes a motor drive conductor array, the motor drive conductor array generating a drive magnetic field and a stray magnetic field when electrical current is directed through the motor drive conductor array, the drive magnetic field interacting with the magnetic fields of the magnets to generate a reactive force that is used to move one of the components relative to the other component; and an auxiliary conductor array that generates an auxiliary magnetic field that interacts with the stray magnetic field and reduces the stray magnetic field.”

These features are not taught or disclosed by Markle. Accordingly, claim 23 is believed to be patentable under 35 U.S.C. §102(e). Additionally, the Applicants respectfully submit that any potential 35 U.S.C. §103 rejection of claim 23 is not appropriate because Markle does not teach or suggest the features of claim 23.

Because claims 24, 30, 36 and 39-43 depend directly or indirectly from claim 23, they are likewise patentably distinguishable over Markle.

Further, in contrast to the cited reference, claim 44 of the present application requires “(a) method for manufacturing a brushless electric motor ... comprising the

steps of: providing a magnet component including a plurality of magnets, each of the magnets being surrounded by a magnetic field; providing a conductor component that includes a motor drive conductor array, the motor drive conductor array generating a drive magnetic field and a stray magnetic field when electrical current is directed through the motor drive conductor array, the drive magnetic field interacting with the magnetic fields of the magnets to generate a reactive force that is used to move one of the components relative to the other component; and providing an auxiliary conductor array that generates an auxiliary magnetic field that interacts with the stray magnetic field and reduces the stray magnetic field.”

These features are not taught or disclosed by Markle. Accordingly, claim 44 is believed to be patentable under 35 U.S.C. §102(e). Additionally, the Applicants respectfully submit that any potential 35 U.S.C. §103 rejection of claim 44 is not appropriate because Markle does not teach or suggest the features of claim 44.

Because claims 45, 48 and 54-58 depend directly or indirectly from claim 44, they are likewise patentably distinguishable over Markle.

Rejections Under 35 U.S.C. § 103(a)

Claims 12, 13, 34, 35 and 51

Claims 12, 13, 34, 35 and 51 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Markle in view of U.S. Patent No. 5,352,946 issued to Hoffman et al. (“Hoffman et al.”). The Applicants respectfully traverse the rejection of claims 12, 13, 34, 35 and 51, and respectfully submit that claims 12, 13, 34, 35 and 51 are patentable over the cited combination of references.

The Examiner asserts that “Markle discloses the brushless motor with the conductor and magnet arrays but does not disclose a conductor housing.” Hoffman et al. is further cited for disclosing “a housing for the conductor component of a planar motor in column 4 lines 55-60.” It is the Examiner's position that “(s)ince Hoffman et al. and Markle are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a housing for a brushless planar motor in order to protect the motor from damage and to keep gases, liquids or solids from a motor from contaminating a clean room.”

As provided above, claim 1 is believed to be patentable over Markle. Additionally, Hoffman et al. does not teach or suggest the features of claim 1 that are not taught or disclosed by Markle. Claims 12 and 13 depend either directly or indirectly from claim 1. Therefore, claims 12 and 13 are believed to be patentable over the cited combination of references.

Somewhat similarly, as provided above, claim 23 is believed to be patentable over Markle. Additionally, Hoffman et al. does not teach or suggest the features of claim 23 that are not taught or disclosed by Markle. Claims 34 and 35 depend either directly or indirectly from claim 23. Therefore, claims 34 and 35 are believed to be patentable over the cited combination of references.

Somewhat similarly, as provided above, claim 44 is believed to be patentable over Markle. Additionally, Hoffman et al. does not teach or suggest the features of claim 44 that are not taught or disclosed by Markle. Claim 51 depends directly from claim 44. Therefore, claim 51 is believed to be patentable over the cited combination of references.

Claims 16, 17, 37, 38, 52 and 53

Claims 16, 17, 37, 38, 52 and 53 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Markle in view of U.S. Patent No. 5,196,745 issued to Trumper ("Trumper"). The Applicants respectfully traverse the rejection of claims 16, 17, 37, 38, 52 and 53, and respectfully submit that claims 16, 17, 37, 38, 52 and 53 are patentable over the cited combination of references.

The Examiner asserts that "Markle discloses the motor with the conductor and magnet arrays but does not disclose the conductor component positioned between magnet arrays." Trumper is further cited for teaching "in column 7 lines 10-15 that either the magnet component or the coil component can be movable. Trumper teaches making the magnet movable because it is easier to make electrical connections to a fixed coil. However coils are generally lighter than magnets and therefore the size of the motor can be reduced when the coil is the movable member." The Examiner further provides that "Trumper also teaches in column 9 that a planar motor can have force producing elements on one side of a movable member or on both sides of a movable member. Having elements on only one side simplifies controls and allows a larger work area on top of the

platen while elements on two sides allows more control and positional stability.” It is the Examiner's position that “(s)ince Trumper and Markle are both from the same field of endeavor, it would be obvious at the time the invention was made for one of ordinary skill in the art to have utilized a motor drive conductor component positioned between two magnet arrays in order to reduce the size of the motor required and also increase the positional stability and control of the motor.”

Still further, the Examiner asserts that “(i)n regard to claims 17, 38 and 53, in Markle the auxiliary conductor components are co-planar with the drive conductor components as shown in figure 6. Therefore when the drive conductor component is between two magnet arrays, the auxiliary conductor component will also be between the two magnet arrays.”

As provided above, claim 1 is believed to be patentable over Markle. Additionally, Trumper does not teach or suggest the features of claim 1 that are not taught or disclosed by Markle. Claims 16 and 17 depend either directly or indirectly from claim 1. Therefore, claims 16 and 17 are believed to be patentable over the cited combination of references.

Somewhat similarly, as provided above, claim 23 is believed to be patentable over Markle. Additionally, Trumper does not teach or suggest the features of claim 23 that are not taught or disclosed by Markle. Claims 37 and 38 depend either directly or indirectly from claim 23. Therefore, claims 37 and 38 are believed to be patentable over the cited combination of references.

Somewhat similarly, as provided above, claim 44 is believed to be patentable over Markle. Additionally, Trumper does not teach or suggest the features of claim 44 that are not taught or disclosed by Markle. Claims 52 and 53 depend either directly or indirectly from claim 44. Therefore, claims 52 and 53 are believed to be patentable over the cited combination of references.

Remaining References

The references cited by the Examiner, but not relied on for the rejection of claims, have been noted. The remaining references are no more pertinent than the applied references, therefore, a detailed discussion of these remaining references is deemed

unnecessary for a full and complete response to the Office Action.

Conclusion

In conclusion, the Applicants respectfully assert that claims 1-58 are patentable for the reasons set forth above, and that the application is now in a condition for allowance. Accordingly, an early notice of allowance is respectfully requested. The Examiner is requested to call the undersigned at 858-456-1951 for any reason that would advance the instant application to issue.

Dated this the 3rd day of July, 2003.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'S / R' with a stylized flourish.

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